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NEVADA

By Fred V. Carrillo, Jonathan G. Price, Stephen B. Castor,
and Richard B. Jones

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NEVADA

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Contents

Trends and Developments 2
Employment 2
Regulatory Issues 2
Exploration Activities 2
Legislation and Government Programs 2
Fuels 3
Review by Nonfuel Mineral Commodities 3
Metals 3
Copper 3
Gold 3
Mercury 4
Silver 5
Other Metals 5
Industrial Minerals 5
Barite 5
Cement 5
Clays 5
Diatomite 5
Gypsum 5
Lime 5
Sand and Gravel 5
Construction 5
Industrial 6
Stone (Crushed) 6
Other Industrial Minerals 7

Tables

Table 1.—Nonfuel Mineral Production in Nevada 1
Table 2.—Nevada: Crushed Stone Sold or Used by Producers in 1991, by Use 6
Table 3.—Nevada: Crushed Stone Sold or Used by Producers in 1991, by District and Use 6
Table 4.—Nevada: Crushed Stone Sold or Used, by Kind 7
Table 5—Principal Producers 9

State Map

Principal Mineral-Producing Localities in Nevada 8

COVER PHOTO:
The Nevada Capitol Building in Carson City symbolizes the cooperative working relationship between the U.S. Bureau of Mines and the mineral agencies of the State.

For comments or further information, please contact

Fred V. Carrillo
Regional Office of State Activities
U.S. Bureau of Mines
Reno Research Center
1605 Evans Ave.
Reno, NV 89512
Telephone: (702) 334-6605

THE MINERAL INDUSTRY OF NEVADA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Nevada Bureau of Mines and Geology for collecting information on all nonfuel minerals.

By Fred V. Carrillo,[1] Jonathan G. Price,[2] Stephen B. Castor,[3] and Richard B. Jones[4]

Nevada's 1991 nonfuel mineral production was valued at $2,392,901, approximately 8.7% lower than that of 1990. Nevada ranked third nationally in the value of its nonfuel mineral production, accounting for 8% of the U.S. total.

Nevada was the largest producer of barite, gold, mercury, and silver among the States. It was the sole producer of mined magnesite and brucite. Gold mining accounted for 86.5% of the total nonfuel mineral value produced in the State during 1991 and 61% of the Nation's total gold production. Silver, almost all as a byproduct from gold production, accounted for an additional 5% of the State's production value. Principal nonfuel minerals produced in Nevada, in order of value, were gold, silver, construction sand and gravel, diatomite, lithium carbonate, lime, cement, barite, gypsum, and clay.

The data presented in table 1 are based on 1991 production figures that were reported by industry to the U.S. Bureau of Mines. The Nevada Bureau of Mines and Geology (NBMG) collected and reported similar information, partly obtained from the Nevada Department of Minerals, in a 51-page NBMG special publication (MI-1991), "The Nevada Mineral Industry, 1991." In addition to production statistics, this publication contains sections on metals, precious metals, industrial minerals, oil and gas, geothermal energy, and a directory of active mining operations.

TABLE 1
NONFUEL MINERAL PRODUCTION IN NEVADA[1]

Mineral		1989		1990		1991	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Barite	thousand metric tons	209	$3,473	337	$5,884	374	$11,933
Clays[2]	metric tons	57,264	5,457	34,625	4,098	15,553	3,204
Gemstones		NA	1,402	NA	407	NA	958
Gold[3]	kilograms	153,995	1,894,172	r179,078	r2,216,233	177,312	2,071,009
Lead[3]	metric tons	—	—	830	842	W	W
Mercury	do.	W	W	W	W	57	202
Perlite	short tons	5,000	136	W	W	W	W
Sand and gravel:							
Construction	thousand short tons	e20,000	e70,000	18,377	59,008	e20,300	e69,000
Industrial	do.	718	W	607	W	546	W
Silver[3]	metric tons	625	110,442	r646	r100,146	578	75,050
Stone (crushed)	thousand short tons	1,560	4,638	e1,600	e5,000	1,199	6,527
Zinc[3]	metric tons	—	—	7,889	12,973	W	W
Combined value of brucite, cement (portland), clays [fuller's earth (1990-91), kaolin], copper, diatomite, fluorspar (1989-90), gypsum (crude), lime, lithium minerals, magnesite, molybdenum, salt, and values indicated by symbol W		XX	220,441	XX	r216,820	XX	155,018
Total		XX	2,310,161	XX	r2,621,411	XX	2,392,901

eEstimated. rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value include with "Combined value" data. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Excludes certain clays; kind and value included with "Combined value" figure.
[3]Recoverable content from ores, etc.

TRENDS AND DEVELOPMENTS

After 11 straight years of continued increases, gold production in the State declined slightly during 1991 from about 180,000 kilograms in 1990 to 177,312 kilograms or 5,700,705 troy ounces in 1991. Nevada continued to be the leading gold-producing State in the Nation yielding more than 60% of all gold produced in the United States and approximately 9% of all gold produced in the world. Relatively low gold prices, uncertainties regarding the access to Federal lands, and increasingly more restrictive State and Federal regulations caused a substantial decrease in exploration activity since the peak in 1988.

Two of the three base metal operations in the State, the Ward Mountain lead-zinc-copper-silver operation in White Pine County and the Cyprus-Tonopah (Hall) molybdenum-copper Mine near Tonopah in Nye County shut down during the year.

Industrial minerals experienced an 8% decline in total value of production, attributed to a slowdown in construction activities in both California and Nevada, that resulted in lower production of aggregate and gypsum.

EMPLOYMENT

According to the Nevada Employment Security Department, 13,005 workers were employed in the Nevada mining industry in December 1991, a 6.5% decrease from that of the previous year and a 7% drop from the peak employment of 15,000 workers reported in July 1990. Metal mining employment averaged 12,144 workers during the year. Precious-metals operations employed the largest number of workers, followed by the sand and gravel industry. Other mining employment averaged 1,200 workers during 1991 for a total yearly average of 13,345 workers in the mining industry.

REGULATORY ISSUES

Several bills were passed by the 1991 Nevada Legislature that affected mining regulations. These included Assembly bill 78, which revised several mining regulations and required each mining operator to file a yearly report with the Nevada Department of Minerals on the status of their mining, exploration, and reclamation operations; Assembly bill 351, which provided penalties for violation of State hazardous waste provisions; Assembly bill 533, which imposed annual assessments from $50 to $10,000 on the development of a body of water injurious to wildlife; and Assembly bill 592, which revised requirements for mining reclamation payments, fees, and verification of surety.

In addition, the Senate enacted S.B. 41, which authorized the State's Division of Environmental Protection to develop new rules governing hazardous chemicals. The law required firms that deal with hazardous chemicals to register with the State, provide an inventory of their chemicals, list safety procedures, and complete a safety and risk evaluation.

EXPLORATION ACTIVITIES

Precious-metals exploration activities in the State continued to decline as many gold producers shifted their exploration programs to foreign countries, partly in response to increased regulations as well as lower prices and more favorable conditions offshore. However, exploration drilling continued throughout Nevada, with most activity centered around producing gold properties. A survey conducted by the Nevada Department of Minerals showed that 27 exploration offices in Reno had reduced their geology staffs by 23% from March 1990 to March 1991.

Two significant gold exploration discoveries were announced during the year. Placer Dome Inc. announced the discovery of a sizable gold ore body at the Pipeline deposit in Lander County in 1991. The discovery, near the Cortez and Gold Acres deposits, was said to have been made beneath 500 feet of alluvium.

In November, Atlas Corp. encountered a new gold ore body, which was designated the Gold Canyon deposit, northwest of its Gold Ridge Mine in Eureka County.

Exploration near eight producing mines added new reserves, mostly from deep deposits. Among those were the New Deep/Gracie deposit in the Jerritt Canyon district of Elko County; the Dee Mine properties on the Carlin trend, the Getchell Mine, deep deposits below the Sleeper Mine, at Talapoosa in Lyon County; the Aurora in Mineral County; and at the Rosebud deposit in Pershing County.

LEGISLATION AND GOVERNMENT PROGRAMS

The U.S. Bureau of Land Management announced the availability of seven open file reports on areas in Nevada being considered for possible recommendation as suitable for wilderness. The reports were prepared by the U.S. Geological Survey and the U.S. Bureau of Mines. Areas that were studied included: Marble Canyon-White Pine County; Lime Canyon, Clark County; Black Rock Desert, Humboldt County; Queer Mountain, Esmeralda County; Grapevine Mountain, Esmeralda County; La Madre Mountains, lark County; and El Dorado and Ireteba Peaks, Clark County.

During fiscal year (1991), the MacKay School of Mines, University of Nevada, Reno, received allotment grants of $148,000 under the Mining and Minerals Research Institute (MMRRI) program. Programs included its Generic Mineral Technology Center; Mineral Industry Waste Treatment; and recovery, pyrometallurgy, and comminution studies.

A major effort at the U.S. Bureau of Mines, Reno Research Center, during 1991 was to develop advanced technology for the processing of ores, scrap, and waste into useful products. Investigations resulted in developing a promising new method for recovering platinum-group metals (PGM) from spent catalytic

convertors. Work also continued on a potential low-temperature way to recover PGM from Stillwater, MT ores by bio-oxidation. Research was also conducted on microwave heating of ore minerals, in-place leaching chemistry, rapid rate reduction and smelting technology, in situ leaching, and the recovery of flake graphite from kish (a steelmaking waste).

Research on environmental technology at the Reno Research Center focused on fundamental studies to delineate the origin, source, and significant factors leading to acid formation and metal and non metal contamination. Among the methods studied were control strategies to minimize acid formation and metal and non metal contamination by inhibiting the reactions and migration of contaminated waters, and treatment technology to neutralize acid waters while recovering or removing toxic metals and non metals. Research was also begun on effective closure methods for metallurgical processing operations.

Another area of research at the center was the Bureau's Advanced Mining Systems program, which addressed revolutionary new mining methods that could recover minerals more efficiently and curtail the harmful impact of mining on the environment. Among these were studies to determine if micro-organisms can be used to extract metals from ores under conditions of in situ leaching and whether bacteria can be used to decompose sulfide minerals in situ. Investigations were also begun on the stability of frozen tailings as backfill material and their durability for long-term deposition in underground mines.

The Bureau continued research on the use of micro-organisms in hydrometallurgical applications, including bacterial heap leaching of domestic manganese ores and oxidation of a PGM sulfide concentrate by bacterial preleaching followed by subsequent chemical leaching to recover a high-grade PGM product.

FUELS

Nevada's 1991 oil production decreased about 15% from that of 1990. Total net production of 3,425,960 barrels (1 barrel equals 42 gallons) was reported from 10 fields, according to the Nevada Department of Minerals. Three wells in the Grant Canyon Field of Nye County accounted for 62% of Nevada's total 1991 oil production. Four new producing wells were reported during the year, all from fields in Railroad Valley in Nye County.

The Kate Spring Field in the Railroad Valley area produced 53,304 thousand cubic feet of gas in 1991, which was used to operate production and related equipment at the lease sites of Apache Corp., David M. Evans, Inc., and Western General, Inc.

Forty-five geothermal well permits were issued by the Nevada Department of Minerals during 1991, and 14 geothermal wells with a total footage of 41,200 feet were reported to have been drilled. Total Nevada geothermal electrical energy net production in the State in 1991 was estimated by the Nevada Department of Minerals to be 895,021 megawatt hours with a sales value of about $76,500,000. Production capacity from the 10 existing geothermal power/plants in Nevada was 146.6 mega-watts.

REVIEW BY NONFUEL MINERAL COMMODITIES

For some commodities, 1991 production data obtained by the U.S. Bureau of Mines and NBMG is differed. Production data obtained from a single company may differ between the agencies, and some companies reported production to one agency, but not to the other. The NBMG production figures are mainly obtained from local offices of the reporting companies, whereas the U.S. Bureau of Mines data come mainly from the national headquarters. In addition, there are differences in the types of materials reported by the two agencies. For instance, NBMG collected data on magnesia production from an operation in Nevada, whereas the U.S. Bureau of Mines obtained data on magnesite and brucite production from the same operation. Other commodities for which the two agencies received significantly different data include barite, clays, crushed stone, and lime. The two agencies are currently working to resolve differences in production statistics.

Metals

Copper.—After a dramatic rise in 1990 copper production, Nevada's 1991 copper output dropped 54%. Copper was principally produced in the State from oxide dumps at Airmetco International Inc.'s Copper Tek Mine in Lyon County. Production was increased with the help of a new 65,000-pound-per-day solvent extraction-electrowinning plant, at the Yerington Mine, that was completed in the fall. Airmetco International Inc. and Holcorp Mines Ltd. acquired the MacArthur property, 4 miles north of Weed Heights in Lyon County, to expand their copper mining operation west of the Yerington Mine. The Nevada Department of Minerals reported Airmetco produced 4.25 million pounds of copper from the Yerington property. Most of the production was from an old stockpile, mined by the former owner, which was said to contain more than 30 million tons of oxide material grading 0.25% copper.

Magma Nevada Mining Co., a subsidiary of Magma Copper Co., purchased a 12,000-acre position in the Robinson Mining District, west of Ely. Magma announced plans to begin mining copper ore at its property in 1994, and feasibility studies were begun to supply concentrates for the company's smelter in Arizona. The October purchase was said to ensure a long-term supply of low-cost copper concentrates for the companies smelter in Arizona.

Alta Gold shut down its Ward Mine/Taylor mill copper, silver, lead, and zinc operations in March at both White Pine County facilities.

Gold.—Nevada continued to maintain its position as the Nation's principal gold-producing state. Fifteen of the Nation's leading 25 gold mines in 1991 were in Nevada. The value of Nevada's annual

gold production dropped about 6% from that of 1990 to $2,071,009,000, although production was less than 1% below the 1990 total, as gold prices continued their decline from the 1987 high. Nevada mines produced 177,312 kilograms (5.70 million troy ounces) of gold during 1991. Production was reported to the U.S. Bureau of Mines from 57 lode and 2 placer mines in 9 counties. Eureka County was the largest gold-producing county, followed, in descending order, by Humboldt, Nye, Elko, Lander, and Mineral Counties, all of which produced more than 200,000 ounces of gold.

Newmont Gold Co. (NGC), with operations centered around Carlin in northeastern Eureka County, was the State's dominant gold-producing company. NGC reported gold production of 49,144 kilograms (1.58 million troy ounces) during 1991 from its five mill and heap-leach operations along the Carlin Trend. According to the Nevada Department of Minerals, the majority was from the Gold Quarry Mine, which reported 1,034,500 ounces (32,177 kilograms) of gold production in 1991, making it the first North American Mine to produce 1 million ounces in a single year. To achieve the 1991 production, 80 million tons of material was mined, 9.1 million tons was treated in two mills, and another 15.6 million tons was treated by heap leaching. NGC announced increased reserves at the end of the year of 20.1 million ounces from 18.9 million ounces at the end of 1990.

The Barrick Goldstrike Mine, owned and operated by American Barrick Resources Corp. produced 546,146 troy ounces of gold (16,987 kilograms) and 22,000 ounces of silver (684.3 kilograms) during 1991, according to the Nevada Department of Minerals. Barrick's Mill No. 2 officially started up on April 13 as part of the planned expansion to process the higher grade sulfide ores. Two autoclaves were also added to the system, which was operating at a rate of 9,000 tons per day by August.

Independence Mining Co. announced plans in April to expand its milling facilities and increase the size of its tailing pond at the Jerritt Canyon Mine in Elko County. During the year ore was mined from two open pits within the Jerritt Canyon property—Upper North Generator Hill and West Generator Hill. The ore was processed at two fluid bed roasters on the property that handle approximately 3,700 tons per day of highly refractory ore and 4,000 tons per day processed in the mill's existing chlorination treatment system.

New mine openings slowed from the rapid expansion since 1982, but new operations were announced at three Nevada mines. Santa Fe Pacific poured its first gold at the Lone Tree Mine near Valmy in Humboldt County on August 13th. USMX began mining operations at its Winrock property in White Pine County in early July, when mining was completed at its Casino Mine after 1 year of operation. According to news reports, final ore production at Casino totaled 594,000 tons with a total gold content of about 32,000 troy ounces (995 kilograms), most of which was expected to be recovered by heap leaching. USMX also began mining and stockpiling ore at its Yankee Mine and process facilities 5 miles south of the Alligator Ridge Mine in White Pine County. Mining and stockpiling of ore was begun at the rate of 50,000 tons of ore per month. A portable, three-stage crushing plant was moved on-site from the Alligator Ridge Mine. Amax Gold Inc. completed construction of a larger grinding mill with throughput running about 2,250 tons of ore per day at its Sleeper Mine in Humboldt County. St. George Metals processed ore and developed four different adit levels within the underground Dean gold mine near Battle Mountain. Pilot production was started in stopes between levels four and three and between levels six and five.

Independence Mining Co. delineated considerable reserves at its New Deep/Gracie deposit near the Jerritt Canyon Mine in Elko County. First Mississippi Gold encountered additional reserves at its Getchell Mine in Humboldt County, reportedly increasing its proven and probable minable mill reserves by 15% and average ore grade by 20%. Crown Resources drilled on the Cord Ranch property located on the southern end of the Carlin Trend in Eureka County. Rayrock Yellowknife Resources completed infill definition drilling work to add further ore reserves to the Dee Mine in Elko County and the Pinson Mine in Humboldt County.

Besides exploration activities in these areas, Oliver Hills Mining Co. drilled in the Billy the Kid area in Storey County, and Consolidated Nevada Goldfields explored near Willow Springs in Nye County. Battle Mountain Exploration Co. and Santa Fe Pacific Mining Co. explored Horizon Gold Corp.'s Buffalo Valley property in Lander County.

Cornucopia Resources Ltd. and Galactic Resources Ltd. began a $1.7 million drilling program at their Ivanhoe Joint Venture on the Carlin Trend. Consolidated Nevada Goldfields started a developmental drilling program in Nye County near its Aurora Mine near Hawthorne.

Mining operations at Cominco Resources Buckhorn Mine in Eureka County ceased in May, but gold recoveries from the heap-leach operation were to be continued into 1992. Mining operations also ceased at Atlas Corp.'s Goldstone-South deposit in Eureka County in July. Gold King Consolidated suspended mining at the Adelaide-Crown Mine in Humboldt County in the 2d quarter of 1991. Near yearend, Asamera Minerals suspended all production operations at its Storey County Gooseberry Mine. Homestake Mining Co. completed mining operations at the Wood Gulch Mine in Elko County and began reclamation work at the 40-acre mine/site, including neutralization of the leach pad and reclamation of the leach pad and plant facilities. Inland Gold & Silver Corp. ceased operations at the Toiyabe Mine in Lander County in May 1991 and began reclamation and detoxification of the site.

Mercury.—Nevada was the principal mercury producer in the United States with production derived as a byproduct recovered from gold operations in Elko, Eureka, Humboldt, Mineral, Nye, and Washoe Counties. Total production was

1,654 flasks or 57.02 metric tons of mercury, valued at more than $200,000. FMC Corp's Paradise Peak Mine in Nye County was the principal producer.

Silver.—Most of the 11% decline in Nevada's 1991 silver production from that of 1990 was attributed to decreased production at the Candelaria Mine in Mineral County. Candelaria ceased mining in 1990, but continued to produce silver in 1991 from its heap-leaching operations. Despite the decline, Nevada remained the leading silver-producing State in the Nation, reporting 578 metric tons of silver valued at $75,050,000. The Couer Rochester Mine, with a silver-to-gold production ratio of approximately 95:1 and the Candelaria Mine, with a silver-to-gold production ratio of approximately 590:1 were the only producers to qualify as silver mines.

About 60% of the silver produced in Nevada in 1991 was a byproduct from gold mining. Byproduct silver production increased considerably during the year at Echo Bay Mines Ltd.'s McCoy/Cove Mine to a reported 1.4 million troy ounces (about 44 metric tons) as a result of mining the more silver-rich ore from the Cove deposit.

Other Metals.—Mill production at the Cyprus-Tonopah molybdenum-copper Mine in Lyon County ceased in 1991. Lead and zinc production in the State was solely from Alta Gold Co's Ward Mine, which shut down operations at its White Pine County site in March.

Industrial Minerals

Barite.—Nevada was the leading producer of barite among the States with more than 75% of the total, followed by Georgia and Missouri. It was used principally in drilling fluids with minor use in chemicals and as fillers in paper, plastics, and glass. Nevada's barite production in 1991 was reported to be 374,000 metric tons, which was slightly above the 1990 production. Production valued at $11,933,000 was more than double the value reported in 1990.

Four firms reported 1991 production in Nevada, with M-I Drilling Fluids Co. again ranked the number one producer from its Battle Mountain operations in Lander County. Milpark Drilling Fluids Inc.'s Argenta Mine in Lander County, Standard Slag Inc.'s P&S Mine in Nye County, and Circle A Construction Inc.'s Dry Creek operation in Elko County were additional producers.

Baroid Drilling Fluids Inc. mined barite from the Rossi Mine near Dunphy, but did not report production to the U.S. Bureau of Mines.

Cement.—Portland cement from the Centex Corp.'s Nevada cement plant near Fernley was Nevada's only reported cement production in 1991. An intensive upgrading program, which was expected to increase capacity, was begun at its plant in 1991.

Clays.—Nevada's total clay production increased 7.5% from that of 1991 and consisted of bentonite, fuller's earth, and kaolin varieties. Kaolin was the most valuable of the three types of clay produced, followed by fuller's earth and bentonite. Total bentonite production of 15,553 metric tons was valued at more than $3.2 million. Leading bentonite producers included Floridin Co.'s IMV Div., and Vanderbilt Minerals Corp. Floridin also produced fullers earth. Centex Corp. was the principal kaolin producer.

Diatomite.—Nevada's 1991 diatomite production ranked second to California among the States, despite a 5% drop. Eagle-Picher Industries Inc. was the State's largest producer, mining diatomite at three locations in northern Nevada. Eagle-Picher's Colado plant in Pershing County and Clark plant in Lyon County produced diatomite for filtration, insulation, and filler uses. C.R. Minerals in the Fernley area and Grefco Inc. at Basalt also produced absorbent and filler-grade material in Churchill and Esmeralda Counties.

Gypsum.—Weakness in the construction industry in Nevada and California in 1991 resulted in a 12.7% decrease in Nevada's crude gypsum production and a 17% decrease in calcined gypsum production. Pacific Coast Building Products Inc. and PABCO Gypsum near Las Vegas in Clark County were the largest crude gypsum producers in Nevada followed by USG Corp. at Empire in Washoe County and James Hardie Gypsum and Georgia Pacific Corp. near Las Vegas. Nevada ranked fifth among the States producing calcined gypsum. James Hardie Gypsum in Clark County was the State's largest calcined gypsum producer, followed by U.S. Gypsum in Washoe County and PABCO and Georgia Pacific in Clark County.

Homestead Minerals, a subsidiary of the Art Wilson Co., mined gypsum and anhydrite near Carson City that was sold to cement manufacturers and agricultural users. Nevada Gypsum and Southwestern Minerals mined small amounts of Gypsum in Clark County. Development of the White Beauty gypsum mine on Mount Charleston in Clark County was halted by Delta Minerals Corp. and the company ceased to exist.

Lime.—In 1991, lime production in Nevada increased by about 12% over that of 1990. Chemstar Inc. produced dolomitic lime in Henderson from dolomite mined at Sloan, south of Las Vegas, and high-calcium lime at Apex just northeast of Las Vegas. Chemstar continued to evaluate a high-calcium lime project near Winnemucca. Continental Lime, Inc. produced high-calcium lime at its Pilot Peak operation near Wendover in Elko County, supplying gold recovery operations in northern Nevada.

Sand and Gravel.—**Construction.**—Construction sand and gravel is surveyed by the U.S. Bureau of Mines for even-numbered years only; data for odd-numbered years are based on annual company estimates. This chapter contains estimates for 1989 and 1991 and actual data for 1990. Nevada sand and gravel

TABLE 2
NEVADA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1991, BY USE

(Thousand short tons and thousand dollars)

Use	Quantity	Value	Unit value
Coarse and fine aggregates: Unpaved road surfacing[2]	135	410	$3.04
Other construction materials[3]	299	1,924	6.44
Other miscellaneous uses[4]	621	3,554	5.73
Unspecified:[5]			
Actual	2	8	3.48
Estimated	141	630	4.47
Total[6]	1,199	6,527	5.45

[1]Includes dolomite, granite, limestone, miscellaneous stone, traprock, volcanic cinder, and scoria.
[2]Includes terrazzo and exposed aggregate, and other coarse and fine aggregates.
[3]Includes concrete aggregate, coarse, stone sand, and bituminous mix or seal.
[4]Includes poultry grit and mineral food, other agricultural uses and cement manufacture.
[5]Includes production reported without a breakdown by use and estimates for nonrespondents.
[6]Data may add to total shown because of independent rounding.

TABLE 3
NEVADA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1991, BY DISTRICT AND USE

(Thousand short tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregates, graded[1]	—	—	W	W
Fine aggregates (-3/8 inch)[2]	—	—	W	W
Coarse and fine aggregates[3]	(4)	(4)	W	W
Other construction materials	—	—	326	2,033
Agricultural[5]	(4)	(4)	—	—
Chemical and metallurgical[6]	(4)	(4)	—	—
Other miscellaneous uses	729	3,856	—	—
Unspecified:[7]				
Actual	2	8	—	—
Estimated	—	—	141	630
Total	731	3,864	467	2,663

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes concrete aggregate (coarse)
[2]Includes stone sand (concrete).
[3]Includes unpaved road surfacing, terrazzo and exposed aggregate, and other coarse and fine aggregates.
[4]Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."
[5]Includes poultry grit and mineral food, and other agricultural uses.
[6]Includes cement manufacture.
[7]Includes production reported without a breakdown by end use and estimates for nonrespondents.

statistics are compiled by geographical districts as depicted in the State map. Tables 2 and 3 present end-use statistics for Nevada's two districts.

Nevada's construction sand and gravel output was estimated to have increased about 10% to 20,000,000 short tons in 1991, from 1990's reported production of 18,377,000 short tons despite the State's recent construction declines. The NBMG reported a 1991 construction aggregate production of 23 million short tons, of which about 10% was crushed stone.

Large producers in the Las Vegas area in 1991 were Bonanza Materials, Inc. (Beazer USA), Nevada Ready Mix Co., Las Vegas Paving Corp., Southern Nevada Paving, Frehner Construction Co., and Wells Cargo, Inc. Although residential construction slowed considerably in 1991, a highway project in Henderson and work on Las Vegas International Airport runways sustained production at near 1990 levels.

Granite Construction Co. was the largest producer in the Reno-Sparks-Carson City area in 1991. Robert L. Helms Construction Co., Paiute Pit Aggregates Inc., Rocky Ridge, Inc., and Sha-Neva Inc. were also major producers. Eagle Valley Construction Co., a major producer in 1990, went out of business in 1991.

Industrial.—Simplot Industries was the principal supplier of industrial sand in Nevada from its Overton pit near Las Vegas. Production of approximately 560,000 tons of silica sand (reported by NBMG) was about 3% less than the 1990 production and more than 20% below record production reported in 1989.

Stone (Crushed).—Crushed stone production is surveyed by the U.S. Bureau of Mines for odd-numbered years only; data for even-numbered years are based on annual company estimates. This chapter contains estimates for 1990 and 1992, and actual data for 1991. Crushed stone in Nevada was derived principally from limestone, dolomite, lightweight granite rock, traprock and volcanic cinders, or scoria. Quantities of crushed stone reported in 1991 were slightly lower than those reported in 1989, with a total of 1,199,000 short tons from all categories. But, value was calculated to be $6,527,000 or 30% higher than that of 1989. Most of the crushed stone was used in construction aggregates, agricultural, chemical, and metallurgical aplications. More specific uses included unpaved road surfacing, terrazzo aggregate, poultry grit, mineral food, and cement manufacture.

TABLE 4
NEVADA: CRUSHED STONE SOLD OR USED, BY KIND

Kind	1989				1991			
	Number of quarries	Quantity (thousand short tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand short tons)	Value (thousands)	Unit value
Limestone	2	W	W	$2.85	2	W	W	$5.76
Dolomite	5	W	W	3.93	3	W	W	4.65
Marble	1	(1)	$1	22.00	—	—	—	—
Granite	1	32	48	1.50	1	33	$53	1.61
Traprock	2	W	W	1.00	2	W	W	3.28
Volcanic cinder and scoria	1	96	640	6.67	1	21	535	25.48
Miscellaneous stone	6	407	1,136	2.79	3	W	W	4.92
Total	XX	1,560	4,638	2.97	XX	1,199	6,527	5.44

W Withheld to avoid disclosing company proprietary data, included in "Total." XX Not applicable.
[1]Less than 1/2 unit.

Other Industrial Minerals.—Basic Inc.'s mine in Nye County was the sole producer of brucite in the United States. Premier Services Ltd., a European refractories manufacturer, acquired the Basic Inc. magnesite mine and magnesia plant at Gabbs during the year. Cyprus Foote Mineral Co. was the only producer of lithium carbonate from brines in the United States which are refined at its adjacent Silver Peak plant in Esmeralda County. Plaster Aggregates, a subsidiary of USG Corp. produced a small amount of expanded perlite from its Empire plant in Washoe County. The Wilkin Mining and Trucking Co. shipped crude and expanded perlite from Lincoln County.

[1]State Mineral Officer, U.S. Bureau of Mines, Reno, NV. He has 26 years of mineral-related government experience and has covered the mineral activities in Nevada for 10 years. Assistance in the preparation of the chapter was given by Marguerite Roberto, program assistant.
[2]State geologist, Nevada Bureau of Mines and Geology, Reno, NV.
[3]Geologist, Nevada Bureau of Mines and Geology, Reno, NV.
[4]Geologist, Nevada Bureau of Mines and Geology, Reno, NV.

NEVADA

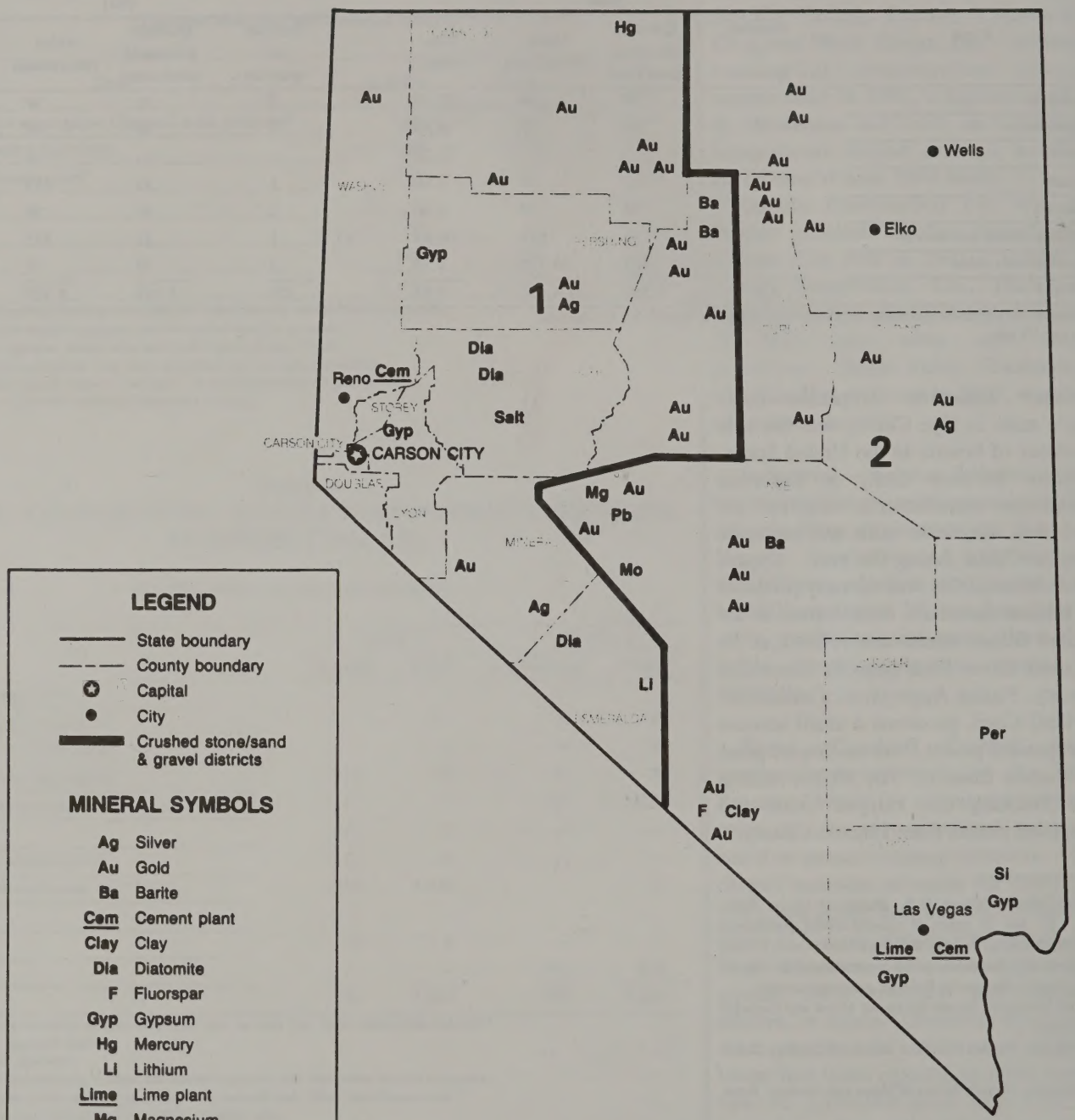
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TABLE 5
PRINCIPAL PRODUCERS

Commodity and company	Address	Type of activity	County
Barite:			
Milpark Drilling Fluids Inc.	Box 22111 Houston, TX 77242	Surface mine and mill	Lander.
M-I Drilling Fluids Inc.	Box 42842 Houston, TX 77242	do.	Do.
Baroid Drilling Fluids Inc.	3000 Sam Houston Pkwy. Houston, TX 77251	Surface mine	Elko.
Cement:			
Centex Corp., Nevada Cement Co.	Box 895 Fernley, NV 89408	Plant	Lyon.
Clays:			
IMV Division of Floridin Co.	Route Box 549 Amargosa Valley, NV 89020	Surface mine and mill	Nye.
Copper:			
Airmetco Inc.	100 Burch Dr. Yerington, NV 89447	do.	Lyon.
Alta Gold Co.	Box 324 East Ely, NV 89315	do.	White Pine.
Cyprus Minerals Co.	Box 3299 9100 E. Mineral Circle Engelwood, CO 80155	do.	Esmeralda.
Diatomite:			
Eagle-Picher Industries Inc., Minerals Div.	Box 10480 Reno, NV 89510	Surface mine and plants	Lyon and Pershing.
Grefco Inc., Dicolite Div.	Box 288 Mina, NV 89422	Surface mine and plant	Esmeralda.
Moltan Co.	Box 860 Fernley, NV 89408	do.	Churchill.
Gold:[1]			
Newmont Gold Co., a subsidiary of Newmont Mining Corp.	Box 979 Carlin, NV 89822	Surface mine, mill, refinery	Eureka.
Round Mountain Gold Corp.	Box 480 Round Mountain, NV 89045	do.	Nye.
American Barrick Resources Corp.	Box 29 Elko, NV 89801	do.	Eureka.
Independence	Mountain City Star Route Elko, NV 89801	do.	Elko.
Battle Mountain Gold Co.	Box 1627 Battle Mountain, NV 89820	Surface mine and mill	Lander.
AMAX Gold Inc.	Box 1820 Winnemucca, NV 89445	do.	Humboldt.
Gypsum:			
James Hardie Gypsum, Inc.	Box 2900 Las Vegas, NV 89124	Surface mine and plant	Clark.
Pacific Coast Building Products Inc.	Box 45 Newark, CA 94560	do.	Do.
USG Corp	101 South Wacker Dr. Chicago, IL 60606	do.	Washoe.
Georgia Pacific Corp.	Box 30006 North Las Vegas, NV 89030	do.	Clark.
Lime:			
Chemstar Inc.	901 Mariner's Island Blvd. Suite 425 San Mateo, CA 94404	Surface mine and plant	Do.

See footnote at end of table.

TABLE 5—Continued
PRINCIPAL PRODUCERS

Commodity and company	Address	Type of activity	County
Lime—Continued:			
Continental Lime, Inc.	Box 2520 Wendover, NV 89883	Surface mine and plant	Elko.
Lithium compounds:			
Cyprus Foote Mineral Co.	301 Lindenwood Dr. Suite 301 Malvern, PA 19335-1740	Dry lake brines and plant	Esmeralda.
Magnesite:			
Premier Services Inc.	Box 177 Gabbs, NV 89409	Surface mine and mill	Nye.
Mercury:			
FMC Corp.	Box 1237 Hawthorne, NV 89415	Surface mine and plant	Do.
Placer Dome U.S. Inc., joint venture	Box 497 McDermitt, NV 89421	do.	Humboldt.
Perlite (expanded):			
USG Corp.	Empire, NV 89405	Plant	Washoe.
Wilkin Mining and Trucking Co.	Box 472 Panaca, NV 89042	Underground mine and plant	Lincoln.
Salt:			
Huck Salt Co.	895 Harrigan Rd. Fallon, NV 89406	Solar evaporation	Churchill.
Sand and gravel:			
Construction:[1]			
Nevada Ready Mix Co.	Box 530 Las Vegas, NV 89125	Pit	Clark.
Las Vegas Paving Corp.	1770 South Industrial Rd. Las Vegas, NV 89102	Pit	Do.
Robert L. Helms Construction Co.	Drawer 608 Sparks, NV 89432-0608	Pit	Lander and Washoe.
WMK Transit Mix, Inc.	Box 14697 Las Vegas, NV 89114	Pits and mills	Clark.
Wells Cargo Inc.	Box 159 Wadsworth, NV 89442	Pit and mill	Washoe.
Granite Construction Co.	Box 2087 Sparks, NV 89432	Pits and mills	Do.
Bonanza Materials (Beazer USA)	565 Lalif Rd. Henderson, NV 89015	do.	Clark.
Frehner Construction Co.	124 W. Brooks Ave. North Las Vegas, NV 89030	do.	Do.
Southern Nevada Paving	3555 Polaris Ave. Las Vegas, NV 89102	Surface mine and plant	Do.
Sha-Neva	Drawer 669 Truckee, CA 95739	do.	Washoe.
Sand (industrial):			
Simplot Industries	Box 308 Overton, NV 89040	do.	Clark.
Stone (crushed):			
Rocky Ridge Inc.	Box 2669 Tuckee, CA 95737	do.	Do.
All-Lite Aggregate	Box 10865 Reno, NV 89510	do.	Storey.

See footnote at end of table.

TABLE 5—Continued
PRINCIPAL PRODUCERS

Commodity and company	Address	Type of activity	County
Stone (crushed)—Continued:			
Rilite Aggregate Co.	Box 11767 Reno, NV 89511	Surface mine and plant	Washoe.
Basalite	2600 Boeing Way Carson City, NV 89706	do.	Lyon.
Southern Nevada Lightweight	4675 Wynn Rd. Las Vegas, NV 89103	do.	Clark.
Centex Corp., Nevada Cement Co.	Box 985 Fernley, NV, 89408	Quarry	Lyon.
Chemstar Inc.	901 Mariner's Island Blvd. Suite 425 San Mateo, CA 94404	Quarries	Do.
Silver:			
Coeur-Rochester Inc.	Box 1057 Lovelock, NV 89419	do.	Pershing.
FMC Corp.	Box 1237 Hawthorne, NV 89415	do.	Nye.
NERCO Minerals Co.	Box 1246 Hawthorne, NV 89415	do.	Mineral.

[1]Listed in descending order of production.

MINERAL-RELATED GOVERNMENT AGENCIES

FEDERAL

U.S. Department of the Interior
Bureau of Mines
Fred V. Carrillo, State Mineral Officer
Reno Research Center
1605 Evans Ave.
Reno, NV 89512
Telephone: (702) 334-6605

U.S. Department of the Interior
Bureau of Land Management
Tom Leshendok, Deputy State Director, Mineral Resources
850 Harvard Way
Box 12000
Reno, NV 89520
Telephone: (702) 328-6376

U.S. Geological Survey
Reno Field Office
Stephen Peters, Geologist-in-Charge
c/o Mackay School of Mines
University of Nevada
Reno, NV 89557-0047
Telephone: (702) 784-5574

STATE

Nevada Division of Environmental Protection
Division of Water Resources
Tom Fronapfel, Water Pollution Control
201 South Fall St.
Capitol Complex
Carson City, NV 89710
Telephone: (702) 885-4670

Nevada Division of Environmental Protection
Division of Air Quality Control
Lowell Shifley, Jr., Environmental Engineer
201 South Fall St.
Capitol Complex
Carson City, NV 89710
Telephone: (702) 885-5065

Nevada Bureau of Mines and Geology
Jonathan G. Price, Director and State Geologist
University of Nevada
Reno, NV 89557
Telephone: (702) 784-6691

Department of Industrial Relations
Division of Mine Inspection
Norton Pickett, Division Administrator
1380 South Curry St.
Capitol Complex
Carson City, NV 89710
Telephone: (702) 885-5243

Department of Minerals
Russell A. Fields, Executive Director
400 West King St., Suite 106
Carson City, NV 89710
Telephone: (702) 687-5050

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